

Task Order 06-10 SSP GFE

1.0 TITLE OF EFFORT: Space Shuttle GFE Projects and CFE Quality Support (WBS 1.3.3)

2.0 DESCRIPTION:

Coordinate and conduct S&MA activities for authorized Space Shuttle Program quality and flight equipment projects (which may include GFE, GSE, CFE, and payloads). Identify and discuss S&MA topics and issues. Participate in all S&MA activities associated with the GFE life-cycle, as defined in EA-WI-023 and EA-WI-025. Provide support to pre and post flight activities as well as to on-orbit operations, including integrated operations assessments. Review proposals and change requests for system designs and design modifications in order to assess S&MA impacts and identify S&MA issues.

2.1 STATEMENT OF WORK REFERENCE Section 6.0 JSC Project Support; Section 5 Program Support

2.2 REQUIREMENTS

2.2.1. SSP GFE Safety and Reliability (WBS 1.3.3.1)

Provide Safety and Reliability support for GFE and Orbiter payloads.

2.2.2 SSP GFE Quality Assurance (WBS 1.3.3.2)

2.2.2.1 Provide In-Line Quality Assurance support for SSP GFE/GSE:

- a. Perform non-RITF related in-line hardware inspection, verification, and documentation tasks associated with receiving, inspecting, fabricating, assembling, testing, processing, and shipping of GFVGSE at JSC facilities.
- b. Oversee facility maintenance in testing labs, and support fit-checks, installation, test readiness, test, and checkout of hardware at JSC and other NASA and contractor facilities.
- c. Perform in-line support of the Bond Rooms for shipping and receiving of flight hardware.
- d. Perform designated Mandatory Inspection Points (MIP's) on SSP hardware/projects at other NASA Centers.
- e. Maintain NT QAS ISO work instructions
- f. Develop and submit Weekly Activity Report to the NASA Monitor of all activities completed or in process.

2.2.2.2 Provide surveillance Quality Assurance for SSP projects/hardware:

- a. Perform and assign as required designated Government Mandatory Inspection Points (GMIP's).
- b. Conduct surveillance of flight systems handling and processing as well as ground facilities with regard to receiving, inspecting, fabricating, assembling, testing, processing, and shipping of GFE/GSE at JSC facilities per the surveillance plan.
- c. Participate as team members or team leaders of process and requirements implementation audits conducted at JSC and contractor facilities.
- d. Perform surveillance of the Bond Rooms which are responsible for ESCG hardware.
- e. Perform, prepare and enter into the appropriate database Surveillance Reports of the ESCG and/or USA in-line activities.
- f. Assist QE in analyzing surveillance data including recommendations for necessary audits and level of surveillance for each area of interest based upon surveillance findings.
- g. Participate in development and modification of GFE to identify and discuss criticality assessments and define S&MA requirements. Identify design problems and provide design solutions or improvements.
- h. Participate in design reviews, review provided data and documentation, and provide

RID'S on S&MA-related issues and deficiencies.

- i. Identify potential hazards, evaluate proposed hazard controls, and evaluate methods
- j. Identify potential critical items list failure modes, causes, effects, methods of verification, and acceptance rationale.
- k. Track and provide status on requirements verification, system qualification, and design certification activities.
- l. Identify missing or non-compliant S&MA requirements as well as performance requirements that cannot be verified. Assess waiver details to assure adequate and appropriate acceptance rationale is performed.
- m. Conduct S&MA assessments, prepare presentations, and present results of those assessments to S&MA management, project management, and the Space Shuttle Program for discussion.
- n. Assure that operational uses, operating limits, hazard controls, and fault tolerance are verified prior to flight.
- o. In accordance with JSC 28035, participate in problem/anomaly investigations during all phases of a project to assure that the problems are appropriately documented; adequate and appropriate investigation is planned and conducted to identify both proximate and root causes; interim and final closure rationale is acceptable; corrective action (if taken) is appropriate and effective; closure documentation (including trend coding) is thorough and complete; and visibility of the problem/anomaly is elevated to the appropriate S&MA management level.
- p. Support operational use of flight GFE. Participate in development of CHIT'S that ensure compliance with hazard report and performance requirements.
- q. Submit operational constraints for flight equipment projects, assure the operational constraints are officially approved for each flight in the Operational Control Agreement Database (OCAD), and verify proper implementation.
- r. Supply special assessments (e.g., PRA and trade studies) and involve subject matter experts, as required.
- s. Provide for operational support to the MER and the SPIT as needed to resolve issues.
- t. In accordance with NT-CWI-004, conduct a risk assessment for shipments with open issues requiring NT management concurrence.

2.2.3. SSP GFE Quality Engineering (WBS 1.3.3.3)

2.2.3.1 Provide Quality Engineering surveillance support for SSP GFE developed at JSC.

- a. Review and approve GFE requirements with respect to SSP requirements and JSC standards and processes.
- b. Implement surveillance of GFE design and development process as defined in EA-WI-023.
- c. Provide surveillance of JSC processes and products with respect to applicable SLP's, including manufacturing, assembling and testing of hardware and associated Work Authorizing Documents (WAD's).
- d. Develop GMIP Plans and assign GMIP's to Criticality 1 or 2 WAD's as applicable in accordance with JSC 63335.
- e. Provide surveillance of acceptance for flight (readiness for shipment) process.
- f. In accordance with SN-D-0007 and SN-S-0008, review acceptance data packages (ADP's) to verify completeness and compliance.
- g. Review and assess GFE readiness for government acceptance. Provide status of readiness in support of System Acceptance Review (SAR).
- h. Provide surveillance of receiving, inspection, processing, and shipment of GFE at JSC facilities.

- i. Submit surveillance data to PBS, participate in the analysis of the data and generation of the surveillance report. Provide monthly metrics and associated report, including recommendations for necessary audits and level of surveillance for each area of interest based upon surveillance findings.
- j. Maintain NT QE ISO work instructions.
- k. Provide administrative function for Quality Systems Technical Review (QSTR) Board and associated secure workgroup website.
- l. Support weekly staff meetings with respect to significant accomplishments, issues, and schedules.
- m. Participate in Test Readiness Review Boards (TRRB's), User Readiness Reviews (URR's), Operational Readiness Review (ORR's), and other appropriate reviews/boards when Criticality 1 or 2 Class I equipment is involved.

2.2.3.2 Provide Quality Engineering in-line support for Space Life Sciences Directorate (SA) Bioastronautics Contract SSP GFE.

- a. Review and approve flight hardware and GSE documents and specifications with respect to all facets of quality engineering; e.g., manufacturability, appropriate sequence of events, key characteristics, and appropriate standards. Review and approve GFE requirements with respect to SSP requirements and JSC standards and processes.
- b. Review and approve plans, drawings, procedures, processes, controls and inspection requirements.
- c. Evaluate inspection/test methods, tools, instruments, and processes.
- d. In accordance with NT-PQE-007, identify mandatory inspection points (MIP's).
- e. In accordance with NT-CWI-003, investigate nonconformances that have occurred at JSC fabrication and test facilities to understand the cause and effects; determine the appropriate disposition for the nonconforming item(s); determine if the nonconformance meets the criteria for a Reportable Problem in accordance to JSC 28035; and, when appropriate, initiate FIAR's. Review the history of similar nonconformance occurrences.
- f. Participate in discussions and meetings with JSC design groups and technical divisions.
- g. Provide review and assistance in the development of critical items lists (CIL's) as a derivative of the failure modes and effects analysis (FMEA).
- h. Provide quality engineering coverage in selected onsite facilities and test area.
- i. Review rejections and/or nonconformances of delivered or manufactured articles. Considerations will include materials, processes, manufacturing methods, inspection and test techniques, handling, and storage.
- j. Prepare and/or provide recommendations for revisions to quality assurance plans for selected onsite facilities and tests.
- k. Evaluate GFE engineering change requests for quality engineering impact. Provide recommendations for acceptance, rejection, or modification to the changes.
- l. Participate in Test Readiness Review Boards (TRRB's), User Readiness Reviews (URR's), Operational Readiness Review (ORR's), and other appropriate readiness reviews/boards.
- m. Maintain a current status of work progress and problems and prepare technical briefings to include previous test problems and open items on test articles and facilities that might affect test planning and operation.
- n. Review the FCE CCB agenda, identify key issues, and prepare necessary IS&QD inputs to the S&MA board member.
- o. Perform in-depth reviews of test plans and procedures.
- p. In accordance with NT-CWI-004, participate in Pre-Shipment Readiness Reviews.
- q. Review and assess GFE readiness for government acceptance. Provide status of readiness in support of System Acceptance Review (SAR).
- r. In accordance with JSC 28035, participate in problem/anomaly investigations during all phases of a project to assure that the problems are properly documented. When appropriate, initiate FIAR's. Assure that adequate and appropriate investigation is planned and conducted to identify both proximate and root causes; interim and final closure rationale is acceptable; corrective actions (if taken) are appropriate and effective;

closure documentation (including trend coding) is thorough and complete; and visibility of the problem/anomaly is elevated to the appropriate S&MA management level.

2.2.3.3 Provide Quality Engineering in-line support for Space Life Sciences Directorate (SA) Food Laboratory SSP GFE.

- a. Participate on PRT.
- b. Initiate and close FIAR's/ISOD's.
- c. Review all space food TPS's and DR's for content accuracy and validity for Space Shuttle.
- d. Review Form 1027's and resolve open items. Review all food lab related drawings for accuracy.
- e. Review all space food specifications, as needed.
- f. Participate in the Space Food systems sensory panel.
- g. Provide disposal of Class 3 food items, as needed.

2.2.4. SSP GFE Software Assurance

Provide Software Assurance, including software safety, software reliability, software quality engineering, software quality assurance, and software verification and validation for GFE flight and ground systems performed at JSC.

- a. Define Software Assurance requirements.
- b. Ensure the conformance of software life-cycle processes and products to Software Assurance requirements, standards, and procedures.
- c. Perform process and product assessment throughout the life-cycle to provide objective insight into the maturity and quality of the software processes and products.
- d. Provide support to boards and panels.
- e. Ensure that the software safety requirements are clearly identified, documented, traced and controlled throughout the software life-cycle.
- f. Perform analysis of the consistency, completeness, correctness and testability of software safety requirements.
- g. Ensure the testing of software safety critical components are sufficiently implemented and that applicable controls are in place to verify all safety conditions.
- h. Conduct analysis of proposed changes on software safety.
- i. Evaluate the reliability of the software products created throughout the life-cycle.
- j. Ensure that the software being developed or maintained satisfies the functional and performance requirements.
- k. Ensure that each phase of the development process yields the right software products.
- l. Participate in major milestone reviews and certification/acceptance of the software.
- m. Conduct surveillance of GFE software life-cycle activities.

2.2.5 SSP CFE S&MA

2.2.5.1. SSP CFE Quality Engineering (WBS 1.3.3.6)

Perform Program-level Quality Engineering (QE) functions.

- a. Perform Program directed analysis of quality assurance related requirements.
- b. Perform Change Requests analysis for SSP related directives and requirements per Program Office direction.
- c. Develop Program related directives/requirements/change requests dealing with quality and provide tracking and support to Program representatives.
- d. Perform facility certifications/surveillance as directed by the Program Office.
- e. Perform Program directed investigations of anomalies.
- f. Provide support to the SSP Quality Panel.

2.2.5.2. SSP GFE/CFE Procurement Quality Assurance

Perform PQA functions at contractors and subcontractors:

- a. Review purchase orders to verify proper inclusion of quality requirements and supplier qualifications. Utilize DCMA Quality Leading Indicator Reports to perform risk assessments for product quality requirements flow down with the DCMA letters of delegation.
- b. Review purchase orders to determine if Government Source Inspection (GSI) is required. Develop GMIP plans in accordance with NPR 8735.2 and coordinate with DCMA.
- c. Review purchase orders to determine appropriate quality instructions.
- d. Assure consistency of contractor and subcontractor activities with Federal Acquisition Regulation (FAR) requirements and requirements of NPR 8735.2.
- e. Prepare Draft DCMA letters of delegations in accordance with NPR 8735.2
- f. Review JSC Purchase Card procurements to verify inclusion of Quality requirement.
- g. Manage and support the Procurement Quality Assurance Database.

2.2.6. SSP GFE and CFE Audits (WBS 1.3.3.5)

Support NASA-sponsored audits.

- a. Provide historical data as to previous SSP audits (audit reports, audit checklists, etc.) to assure consistency of approach by the Audit Management Office and Glenn Research Center.
- b. Provide Space Shuttle Program Master Audit Schedule utilizing SAS. This includes support of the Joint Audit Planning Committee in providing Master Audit Schedule information and determining contractor/subcontractor changes.
- c. Perform process assessments and audits, and prepare reports documenting results.
- d. Perform technical analyses, and present results.
- e. Participate in joint audits with other NASA Centers or government entities to verify S&MA requirements and implementation at NASA contractors, subcontractors, and vendors in accordance with NSTS 60538, NSTS 5300.4(1D-2), and NPR 8735.2.

2.2.7. SSP Flight Readiness (WBS 1.3.3.7)

Assesses and evaluate data and documentation in accordance with NT-ADM-014 and make recommendations for flight readiness of GFE projects. Specific tasks include, but are not limited to:

- a. Data – Records Management
 - Evaluate CCB Change Requests (CR's) and other Program documents to identify flight GFE that has been manifested for flight.
 - Review mission hardware certification length/missions to ensure certification is current for the mission duration.
 - Support GFE engineers in collection and management of data that supports S&MA CoFR evaluation and status reporting in this task order.
 - Implement and manage centralized CoFR endorsement status collection and reporting capability to the frequency defined in NT-ADM-014
 - Evaluate and update NT-ADM-014 to remain current with Program unique CoFR reporting requirements.
 - Track requirements verification and certification status.
 - Assess the configuration and utilization plans against flight certifications.
 - Prepare Certification of Flight Readiness (CoFR) presentations and support to CoFR meetings to discuss status and issues related to MRB's, system acceptance, open items status (1027), data trends, and audit reports.
 - Identify data and information required for accomplishment of S&MA responsibilities and functions leading to flight readiness assessments and CoFR

endorsements. Assess adequacy of data and information to support flight readiness activities.

- Provide status of all open CoFR endorsements, including PRACA and GCAR items, and track the open status through closure to support CoFR presentations.
- Assess QARC documentation on flight item manufacturing and test results in order to report on the status of these items in support of Flight Readiness.
- Perform engineering review of flight GFE for its intended application, including launch, landing and on-orbit operations.
- GFE Records Management in Support of Flight Readiness
- Staff satellite record centers to maintain configuration, status accounting and accessibility to work authorizing and shipping records and data created by engineering according to NASA records requirements

2.3 Deliverables:

Audit Reports

Technical and surveillance metric analyses DRAFT Letters of Delegation

Master Audit Schedule

PBS Surveillance Reports

3.0 PERIOD OF PERFORMANCE: October 1, 2008 - April 30, 2009

4.0 ESTIMATED COSTS:

Contractor may provide travel, training, materials, and other non-labor resources as necessary to support task order requirements. Training may include selected professional discipline-based or spaceflight-based conferences with approval of the TMR.